# ROWLAND

KLICKITAT County

Lake ID: *ROWKL1*

Ecoregion:

Orginally an arm of the Columbia River. The lake was formed by fill when the railroad was constructed here. The lake was originally called DuBois Lake and is better known by that name locally. It is located 4 miles east from Bingen, adjacent to the north side of Bonneville Pool and connected via culvert.

Area (acres)	*Maximum Depth (ft)*	*Mean Depth (ft)*	*Drainage (sq mi)*
84.7			

Volume (ac-ft)	*Shoreline (miles)*	*Altitude (ft abv msl)*	*Latitude*	*Longitude*
		72		
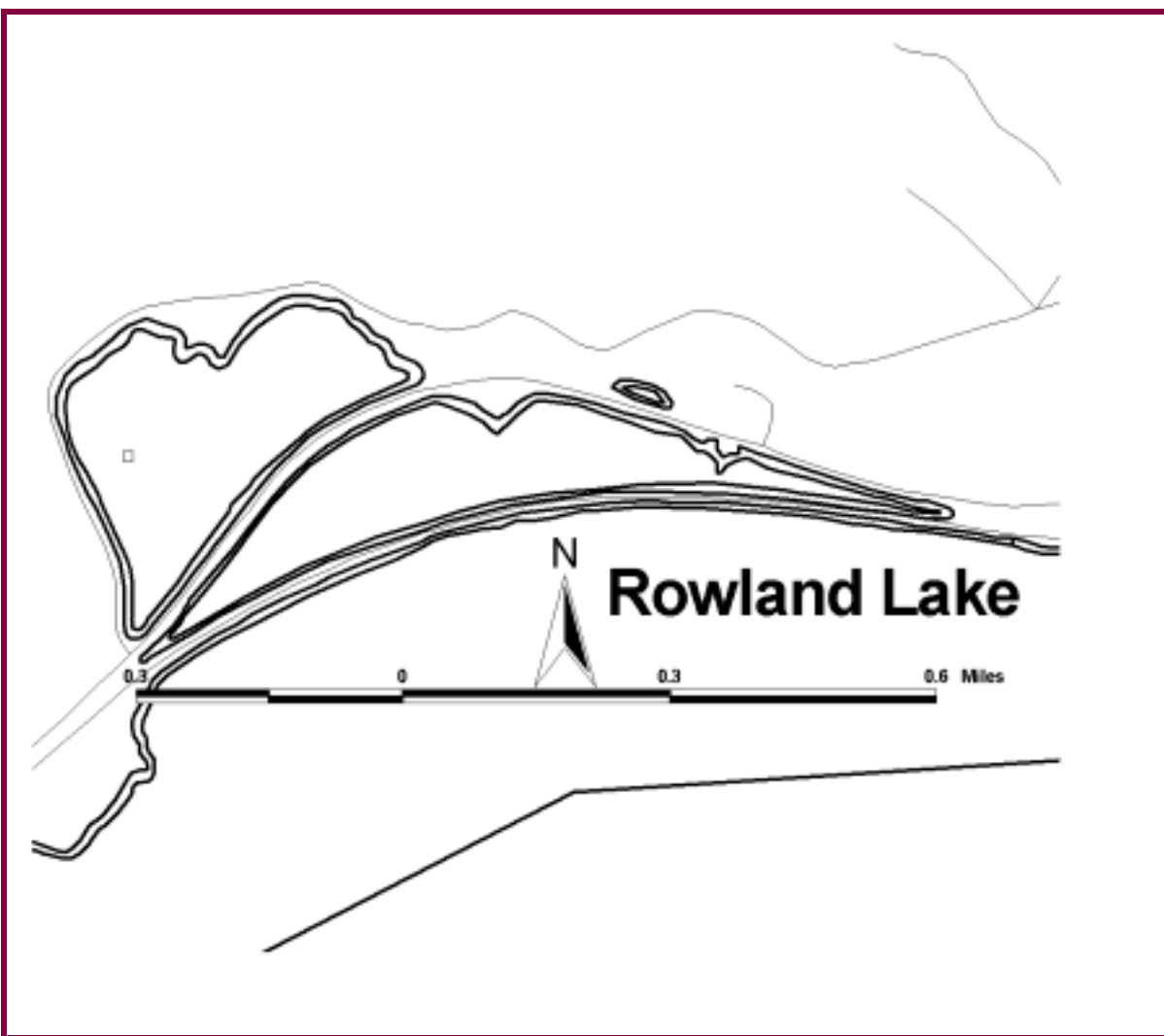
Station Information

Primary Station	Station # 1	latitude: 45 42 27.5	longitude: 121 22 50.7
	Description:	Located directly north of southwest tip of northwest portion (about 1200 feet).	

Trophic State Assessment   for   1999

ROWLAND

Analyst: Sarah O'Neal

TSI_Secchi: [a]	42	N
TSI_Phos:	57	
TSI_Chl:	57	
Narrative TSI:[b]	E	

Rowland Lake is a small lake formed as a gravel pit during railroad construction. Major transportation corridors, one of which was quite busy, surrounded the lake on all sides. There were no homes around the lake, and, with the major exception of roads, the surrounding area was natural. Despite reasonably good water clarity, total phosphorus and chlorophyll levels in the lake indicated a eutrophic system. Macrophytes grew surpsingly sparsely, and algae was not noted as a particular problem. The lake did not thermally stratify, although dissolved oxygen levels dropped sharply between three and four meters in depth.

We did not conduct aquatic plant or habitat surveys on Rowland Lake due to inclement weather. We received only one completed questionnaire for the lake. The respondent, who primarily fished, desired good coldwater fishing, better parking, and a decrease in plant growth. Field observations indicated that fishing was far and away the most popular activity on the lake. Anecdotal evidence from WDFW indicated that the fishery is impaired. They attempted to improve the fishery with a rotenone rehabilitation in 1968. A 1991 WDFW Survey indicated bluegill were the most abundant species in the lake, with brown bullhead, largemouth bass, yellow perch, pumpkinseed, and squawfish also present. Few rainbow trout utilized the lake, though trout have been planted in the past. High temperatures likely severely stressed coldwater fish such as rainbow trout. In addition, field notes indicated that the lake lacked cover provided by macrophytes, or even human structures. This likely stressed cold- and warmwater species alike. The zooplankton community appeared healthy with a large average size that decreased over the summer, indicating utilization by planktivores. However, this suggests a possibly ineffective number of piscivores to effectively suppress planktivore density. The area surrounding the lake also provided habitat for osprey.

The condition of the lake may not support primary uses, particularly coldwater fishing. However, this is a reflection more of the lake's formation and composition than of its trophic state. Consequently, we recommend a total phosphorous criterion of 51.4 (mean 39.9 ug/L plus standard deviation of 11.5 ug/L). Additionally, methods of introducing structure in the form of aquatic plants, woody debris, or some other form of fish cover should be explored.

Mean Secchi = 3.5m (N); Mean TP = 39.9 ug/L; Mean Chl = 14.4 ug/L

[a] TSI Qualifiers: B or W-Secchi Disk hit bottow or entered weeds; J-Estimate; N-Fewer than the required number of samples

[b] E=eutrophic, ME=mesoeutrophic, M=mesotrophic, OM=oligomesotrophic, O=oligotrophic

Chemistry Data   ROWLAND

Date	Time	Strata	Tot P (ug/L)	Tot N (mg/L)	TN:TP	Chloro-phyll (ug/L)	Fecal Col. Bacteria (#/100mL)	Hardness (mg/L)	Calcium (ug/L)	Turbidity (NTU)
Station 1										
6/19/1999		E	40.1	.214	5	6		62.1	16300	
7/7/1999		E	29	.367	13	24.3				
8/5/1999	1300	E	37.3	.315	8	16.1				1.6
9/5/1999	1445	E	45.7	.306	7	15.9				2.5

Strata: L=lake surface, E=epilimnion, H=hypolimnion; Qualifier: J=Estimate, U=Less than, G=Greater than.

Watershed Survey   ROWLAND

Survey Date: 9/5/1999

Land Uses (1 = Primary, 2 = Secondary, etc.)

	Agriculture(commercial, not hobby)			Residential
	Commercial, Industrial		2	Park, forest or natural
1	Major transportation			

Impervious surfaces (Roads and parking area): No Curbs

Observations (check mark denotes presence)

BMP's ☑

Natural shoreline all around the lake

Odors ☐

Cattle ☐   **Ducks** ☐   **Geese** ☐

Fertilizers and weed killers appear to be used in residential or agriculture area ☐

Buffer zones around streams and wetlands ☐

Irrigation ☐

Survey Id: 100

Questionnaire

Results compiled from 1 **Surveys.**	**Average time (years) respondents spent on lake:** 3.00

Did the following add (+1), detract (-1), or have no effect (0) on your enjoyment of the lake today?

Types of WaterCraft:	View:	Distance to Lake:
Public Access:	Swim Beach:	Canada Geese:
Water Clarity:	Water Qual. for Swim:	
Fishing Quality:	Aquatic Plants:	

On a scale of 1 (poor) to 5 (excellent), how would you rate water quality today?   **3.0**

Which would you rather have, 1 or 2?

1) Better fishing and more natural habitat, or 2) clearer water?   2.0

1) Better fishing and more natural habitat, or 2) fewer aquatic plants?   1.0

1) Clearer water, or 2) fewer aquatic plants?

How important is each of the following characteristics to you (1 = very undesirable, 5= very desirable):

Restricted Watercraft:		Good Warmwtr Fishing:		Natural Scenery:	3.0
Plant Growth:	1.0	Good Swimming:		Public Beach:	3.0
Natural Shoreline:		Less Algae:	1.0	Canada Geese:	3.0
No Odors:	3.0	Public Access:	2.0		
Good Coldwtr Fishing:	5.0	Clear Water:	3.0		

Tabulated Results

Survey ID	Date	------------Residency------------	Rent or Own	Primary Activity*	Purchase Factor?	-----Water Clarity----- Has it Changed?	When?
102	9/23/1999	Visitor		2	☐	No	
	Would like better parking						

* 1=canoe/kayak, 2=fish, 3=pers. wtrcrft, 4=mtrboat, 5=sail, 6=swim/wade, 7=watch wldlf, 8=ski, 9=windsurf, 10=relaxing

Zooplankton Report

Date 6/19/1999   Station: 1   About 0.25 mLs counted. Lots of rotifers in sample.
Sample ID 77

Number of organisms measured: #Delet

Group	Percent		Group	Percent
Cladocera	#Deleted		Small < 1mm	#Deleted
Copepod	#Deleted		Large >= 1mm	#Deleted
Other	#Deleted		Ratio of large to Smal	#Num!
			Average size (mm):	0.93

Date 8/5/1999   Station: 1   Site number and length of tow not labelled.
Sample ID 37

Number of organisms measured: #Delet

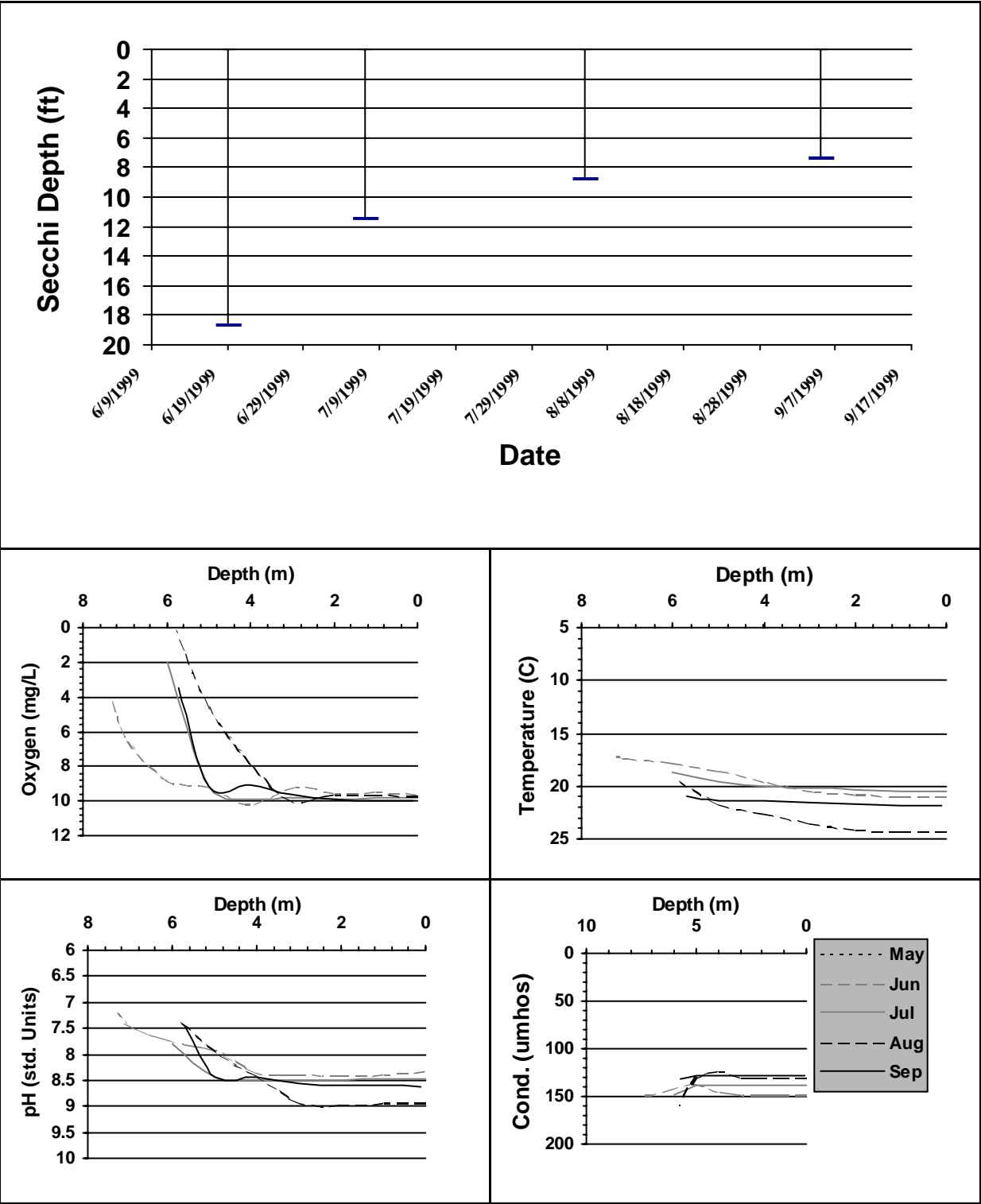| Group	Percent		Group	Percent
Cladocera	#Deleted		Small < 1mm	#Deleted
Copepod	#Deleted		Large >= 1mm	#Deleted
Other	#Deleted		Ratio of large to Smal	#Num!
			Average size (mm):	0.53

Secchi Depth (ft) vs Date (6/9/1999 – 9/17/1999)

Oxygen (mg/L) vs Depth (m)

Temperature (C) vs Depth (m)

pH (std. Units) vs Depth (m)

Cond. (umhos) vs Depth (m)

Legend:
- May
- Jun
- Jul
- Aug
- Sep

Secchi Data and Field Observations ROWLAND

Date	Time	Temp-erature (F)	Secchi (ft)	Color (1-greens, 11-browns	Bright-ness (pct)	Wind (1-none, 5-gusty)	Rainfall (0-none, 5-heavy)	Aesthetics (1-bad, 5-good)	Swimming (1-poor, 5-good)	Geese (#)	Waterfowl (besides geese #)	Boats-Fishing (#)	Boats-Skiing (#)
Station 1													
6/19/1999			18.7	2	0	5	1	5	5	0	0	2	0
Sampler: SMITH					Remarks: People on shore fishing--lots of public access. Lots of large zoo at all depths. Osprey flying above, lots of turkey vultures. Rocky bluffs right off Col. River. 100% road all around lake but most traffic is on Rt. 14.								
7/7/1999			11.48	2	10			5	5	0	0	0	0
Sampler: SMITH					Remarks:								
8/5/1999			8.86	2	100	1	2	5	5	0	0	2	0
Sampler: SMITH					Remarks: Osprey observed. Lots of people visiting lake. Six people fishing from shore.								
9/5/1999			7.38	2	0			5	3	0	0	1	0
Sampler: SMITH					Remarks: Water greener than normal for the season. One osprey fishing.								